

WHAT IS CLAIMED IS:

1. A wireless router for a wireless communications network, comprising:

5 a first interface operable to communicate wireless packets for a call with a mobile device;

a second interface operable to communicate wireline packets for the call with a wireline network; and

10 a traffic controller operable to convert wireline packets received for the call from the wireline network to wireless packets, to route the wireless packets to the mobile device through the first interface, to convert wireless packets received for the call from the mobile device to wireline packets, and to route the wireline packets to the wireline network through the second interface.

20 2. The wireless router of Claim 1, wherein the wireless packets are radio frame packets and the wireline packets are Internet protocol (IP) packets.

25 3. The wireless router of Claim 1, wherein the wireless router is operable to be directly connected to a wireline IP router, the traffic controller further operable to route wireline packets through the second interface directly to the wireline IP router.

30 4. The wireless router of Claim 1, wherein the traffic controller is a technology independent wireless traffic processor.

5. The wireless router of Claim 1, wherein the call is a first call and the mobile device is a first mobile device, further comprising:

5 the first interface operable to communicate wireless packets for the first call with the first mobile device using a first access technology and to communicate wireless packets for a second call with a second mobile device using a second access technology; and

10 the traffic controller operable to convert wireless packets received for the second call from the wireline network to wireless packets for the second access technology, to route the wireless packets to the second mobile device through the second interface, to convert wireless packets received from the second mobile device to wireline packets, and to route the wireline packets to the wireline network through the second interface.

20 6. The wireless router of Claim 1, the traffic controller further operable to communicate with other wireless routers for soft handoff of the call.

25 7. The wireless router of Claim 1, the traffic controller further operable to communicate with other wireless routers through the wireline network for soft handoff of the call.

30 8. The wireless router of Claim 1, the traffic controller further operable to communicate with other wireless routers through the wireline network for ~~micromobility of the call.~~

9. The wireless router of Claim 1, the traffic controller further operable to communicate with a public switched telephone network (PSTN) gateway through the wireline network.

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10. The wireless router of Claim 1, the traffic controller further operable to communicate with a call agent through the wireline network.

11. The wireless router of Claim 1, the traffic controller further operable to communicate with a media gateway through the wireline network.

12. The wireless router of Claim 1, the traffic controller further operable to communicate with a policy manager through the wireline network.

13. The wireless router of Claim 1, the traffic controller further operable to communicate with an authentication, authorization, and accounting (AAA) server through the wireline network.

14. The wireless router of Claim 1, the traffic controller operable to communicate with disparate radio access networks through the wireline network.

15. The wireless router of Claim 1, the traffic controller further operable to classify packets for the call.

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16. The wireless router of Claim 1, the traffic controller further operable to provide security for the call.

5 17. The wireless router of Claim 1, the traffic controller further operable to reserve radio frequency (RF) resources for the call.

10 18. The wireless router of Claim 1, the traffic controller further operable to perform quality of service (QoS) management for the call.

15 19. The wireless router of Claim 1, the first interface, second interface, and traffic controller each further comprising software stored on a computer-readable medium.

20 20. The wireless router of Claim 1, further comprising a virtual path generator operable to configure a wireless virtual path in the wireline network to a second wireless router for soft handoff processing for the call.

25 21. The wireless router of Claim 20, the traffic controller including a selector operable to receive a first instance of traffic from the mobile device, to receive a second instance of the traffic from the second router, and to select one of the instances for transmission to a destination device for the call.

22. The wireless router of Claim 20, the traffic controller including a distributor operable to receive from the wireline network traffic destined for the mobile device, to transmit a first instance of the traffic to the mobile device, and to transmit a second instance of the traffic to the second wireless router for transmission to the mobile device.

23. The wireless router of Claim 20, wherein the virtual path is a label switched path (LSP).

24. The wireless router of Claim 20, the first interface operable to communicate radio frame traffic for the call with the mobile device.

25. The wireless router of Claim 20, the second interface operable to communicate IP traffic for the call with the wireline network.

26. The wireless router of Claim 20, the first interface, the second interface, virtual path generator, and traffic controller each comprising software stored on a computer-readable medium.

27. The wireless router of Claim 20, the first interface, second interface, virtual path generator, and traffic processor each comprising at least one of software stored on a computer-readable medium and hardware encoded with predefined instructions.

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28. The wireless router of Claim 21, the selector further operable to synchronize the instances of the wireless traffic, to compare the instances of the wireless traffic, and to select one of the instances based on the comparison.

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29. The wireless router of Claim 22, the distributor further operable to transmit the second instance of the traffic to the second wireless router with a synchronization bias for synchronous transmission of the second instance with a first instance to the mobile device.

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30. The wireless router of Claim 1, further comprising a path generator operable to configure an Internet protocol (IP) flow in a wireline network to a second wireless router for soft handoff processing for the ~~call.~~

31. A wireless communications network, comprising:
a first router;
a second router;
5 a first virtual path configured between the
first and second routers for transmission of wireline
protocol traffic; and
a second virtual path configured between the
first and second routers for transmission of a wireless
10 protocol traffic.

32. The wireless communications network of Claim
31, the first and second virtual paths each comprising a
label switched path (LSP).

33. The wireless communications network of Claim
31, the wireline protocol traffic comprising Internet
protocol (IP) traffic and the wireless protocol traffic
comprising radio frames.

34. The wireless communications network of Claim
31, the first and second routers operable to
intercommunicate over the second virtual path to provide a
soft handoff for a call.

35. The wireless communications network of Claim
31, the first and second routers operable to
intercommunicate to allocate bandwidth for a call.

36. The wireless communications network of Claim
31, the first and second routers operable to
intercommunicate to reserve resources for a call.

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37. The wireless communications network of Claim 31, the first and second routers operable to intercommunicate to provide mobility management for a call.

38. The wireless communications network of Claim 31, further comprising:

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a set of active routers for a call, the set including the first and second routers; and

the set of routers operable to intercommunicate over virtual paths to provide a plurality of call mobility, soft handoff, and resource management for the call.

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39. A communications packet transmitted on a wireline link, the communication signal comprising:

a radio frame including traffic for a call with a mobile device; and

5 a virtual path label for routing the radio frame to a router for call processing.

40. The communications signal of Claim 39, the virtual path label comprising a multi-protocol label switch (MPLS) path label.

41. The communications signal of Claim 39, wherein the radio frame is generated by the mobile device.

42. The communication signal of Claim 39, further comprising a synchronization bias for the radio frame.

43. The communications signal of Claim 39, the virtual path label identifying a primary router for the call.

SUGGESTION
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5 44. A wireless communications network, comprising:
a plurality of routers; and
the routers each operable to receive traffic
from a mobile device and to route the traffic directly to
an Internet protocol (IP) wireline network.

10 45. The wireless communications network of Claim
44, the routers further operable to intercommunicate to
reserve resources for a call including the mobile device.

15 46. The wireless communications network of Claim
44, the routers further operable to intercommunicate to
allocate bandwidth to a call including the mobile device.

20 47. The wireless communications network of Claim
44, the routers further operable to intercommunicate to
provide a soft handoff for a call including the mobile
device.

25 48. The wireless communications network of Claim
44, the routers further operable to intercommunicate to
provide call mobility for a call including the mobile
device.

49. The wireless communications network of Claim
44, the routers further operable to intercommunicate to
establish a call for the mobile device.

50. A wireless router for communicating signals in a wireless network, the wireless router comprising:

a radio frequency (RF) front end operable to receive a first signal from a mobile device;

5 a selection and distribution unit coupled to the RF front end, the selection and distribution unit operable to receive the first signal, to receive a second signal corresponding to the first signal from a disparate wireless router and to select one of the first signal and the second signal; and

10 a resource manager coupled to the selection and distribution unit, the resource manager operable to communicate the selected signal to a wireline network.

15 51. The wireless router of Claim 50, wherein the wireless router is a first wireless router, and the selection and distribution unit comprises a label switched path (LSP) module operable to define a LSP from the first wireless router to a second wireless router.

20 52. The wireless router of Claim 51, wherein the selection and distribution unit is operable to define the LSP using a forwarding table.

25 53. The wireless router of Claim 51, wherein the selection and distribution unit is operable to define the LSP using a trigger rule.

54. The wireless router of Claim 50, wherein the selection and distribution unit is operable to select one of the first signal and the second signal using pattern matching on a frame-by-frame basis.

55. The wireless router of Claim 50, wherein the selection and distribution unit is operable to select one of the first signal and the second signal using error correction bits.

56. The wireless router of Claim 50, wherein the selection and distribution unit is operable to synchronize the first signal and the second signal using a frame sequence number (FSN) in each of the signals.

57. The wireless router of Claim 50, further comprising an active list comprising at least one cell site with which the mobile device is actively communicating.

58. The wireless router of Claim 50, further comprising a candidate list comprising at least one cell site with which the mobile device is operable to communicate.

59. The wireless router of Claim 50, further comprising an antenna coupled to the RF front end and operable to receive the first signal from the mobile device and to communicate the first signal to the RF front end.

60. A method for configuring a wireless communications network for processing a call, comprising:

receiving a communication from a mobile device
identifying an active set of wireless routers for a call,
the active set of wireless routers including a primary
wireless router and one or more secondary wireless
routers for soft handoff of the call;

informing the primary and secondary wireless
routers of their status;

configuring virtual paths between the primary
and secondary wireless routers; and

allocating resources in the primary and
secondary wireless routers for the call.

61. The method of Claim 60, wherein the wireless
virtual paths are label switch paths (LSPs).

62. The method of Claim 60, wherein the wireless
virtual paths comprise radio frame virtual paths.

63. The method of Claim 60, wherein the wireless
virtual paths comprise LSPs transporting at least one of
CDMA, CDMA 2000, WCDMA, TDMA and GSM radio frames.

64. A method for providing soft handoff for a call including a mobile device, comprising:

receiving an instance of a radio frame from a mobile device at an active set of wireless routers, the active set including a plurality of active wireless routers for a call;

routing the radio frame instances from secondary wireless routers in the active set to a primary wireless router in the active set; and

selecting at the primary wireless router one of the radio frame instances for transmission to a destination device.

65. The method of Claim 64, further comprising:

assembling the selected radio frame instance with other selected radio frame instances to form an Internet protocol (IP) packet; and

transmitting the IP packet to the destination device.

66. The method of Claim 64, wherein the radio frames are routed through virtual path.

67. The method of Claim 64, wherein the radio frames are routed from the secondary wireless routers to the primary wireless router through virtual paths established between the primary and the secondary wireless routers.

5 68. The method of Claim 64, wherein the radio frames are routed from the secondary wireless routers to the primary wireless router through label switched paths (LSPs) established between the primary and the secondary wireless routers.

69. The method of Claim 64, further comprising:
receiving traffic from the destination device at the primary wireless router;

10 multicasting instances of the traffic from the primary wireless router to each of the secondary wireless routers in the active set of wireless routers; and

15 transmitting instances of the traffic to the mobile device from each of the wireless routers in the active set.

20 70. The method of Claim 69, further comprising synchronously transmitting instances of the traffic from the wireless routers in the active set to the mobile device.

25 71. The method of Claim 69, wherein the traffic comprises an Internet protocol (IP) packet, further comprising:

segmenting the IP packet into a plurality of radio frames at the primary wireless router;

multicasting instances of each radio frame to the secondary wireless routers in the active set of wireless routers; and

30 transmitting instances of the radio frame to the mobile device from each of the wireless routers in the active set.

72. The method of Claim 69, further comprising transmitting at least one instance of the traffic from the primary wireless router to a secondary wireless router with a synchronization bias operable to delay transmission of the instance from the secondary wireless router to the mobile device.

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73. A method for providing mobility for mobile devices in a wireless communications network, comprising:

providing an active set of wireless routers including an existing primary wireless router and a plurality of existing secondary wireless routers for performing soft handoff for a call;

receiving a new active set of wireless routers identifying a new primary wireless router and a plurality of new secondary wireless routers;

terminating existing virtual paths between the existing primary wireless router and the existing secondary wireless routers;

establishing virtual paths between the new primary wireless router and the new secondary wireless routers;

informing a network destination device of the call of the new primary wireless router; and

queuing traffic for the call at the new primary wireless router until traffic previously queued in the existing primary wireless router is processed.

74. The method of Claim 73, further comprising:

the existing primary wireless router communicating an activation notice to the new primary wireless router upon processing of all queued traffic;

deactivating the existing primary wireless router; and

activating the new primary wireless router.

75. The method of Claim 73, wherein the virtual paths comprise label switch paths (LSPs)

76. A method for providing mobility for mobile devices in a wireless communications network, comprising:

providing a network anchor wireless router;

5 providing a primary wireless router receiving traffic from a mobile device for a call and forwarding the traffic to the network anchor wireless router through a virtual path for delivery to a destination device;

10 the network anchor wireless router receiving traffic from the destination device and forwarding the traffic to the primary wireless router through a virtual path for delivery to the mobile device; and

receiving a new primary wireless router;

15 terminating the existing virtual path between the network anchor and primary wireless router;

establishing a new virtual path between the network anchor and the new wireless router for communication of traffic for the call.

20 77. The method of Claim 76, wherein the virtual paths comprise label switch paths (LSPs).

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